



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/084,917

03/01/2002

Yang Wang

ASH-01-004

7131

7590

07/10/2006

Technology Law Department
WORLDCOM, Inc.
1133 19th STREET NW
WASHINGTON, DC 20036

EXAMINER

TSEGAYE, SABA

ART UNIT

PAPER NUMBER

2616

DATE MAILED: 07/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/084,917	WANG, YANG	
	Examiner	Art Unit	
	Saba Tsegaye	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8-14, 16, 17 and 19-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-14, 16, 17, and 19-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to the amendment filed 04/25/06. Claims 1-6, 8-14, 16, 17, and 19-27 are pending. Currently no claims are in condition for allowance.

Claim Rejections - 35 USC § 103

2. Claims 1-5, 16, 17, 19-21, 23 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ayres (US 6,687,220) in view of Shafer (US 2002/019874 A1).

Regarding claim 1, Ayres discloses, figs. 1-2, a routing system (20) comprising: a plurality of routing resources (CPU, routing domain, flow rates) and a plurality of virtual routers (VRIs 50 and 52) configured to share selected ones of the routing resources (a single processing unit; a communication interface 40 (DSPs); DRAM).

Ayres fails to disclose resources that are programmably modifiable.

Shafer teaches a router management interface that provides access to software modules and other resources residing on the router. Using the router management interface, the entities can make changes to the present router configuration and more efficiently manage router resources, policies and relationships with other routers (page 1, 0004).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the teachings from Shafer of resources that are programmably modifiable to the routing system of Ayres. The benefit using programmable resource is that programs can be changed and upgraded and new features are added easily than hardware changes.

Regarding claim 2, Ayres discloses the routing system wherein the routing resources include logic resources (CPU; a communication interface 40 (DSPs)) and physical resources (ingress data queue; flow rate; routing domain).

Regarding claim 3, Ayres discloses the routing system wherein the logical resources include routing processes (a communication interface 40) and forwarding process (the CPU selectively retrieves packets from the ingress data queues and forwards them).

Regarding claim 4, Ayres discloses wherein the physical resources include control resources (each VRI 50 and 52 have its own routing domain; ingress data queues 48 formed as linked lists in the DRAM 46 (shared)) and data resources (the respective packet flow rates of the ingress data queues associated with the each VRI are independently adjusted; the system resources of the router 20 can be fairly distributed or restricted and individual user or VRI bandwidth guarantees (column 7, lines 29-59)).

Regarding claim 5, Ayres discloses the routing system wherein the shared selected ones of the routing resources includes routing processes (40), forwarding processes (CPU), control resources (ingress data queues 48 formed as linked lists in the DRAM 46), and data resources (the system resources of the router 20 can be fairly distributed or restricted and individual user or VRI bandwidth guarantees (column 7, lines 29-59))

Regarding claim 16, Ayres discloses a method comprising: allocating a first set of resources as shared resources (a communication interface 40 and a single control function (CPU), DRAM); allocating a second set of resources as non-shared resources (each VRI have its own routing domain; flow manager 54 controls the packets flow rates); and implementing a plurality of virtual routers (VRI 50 and 52) based on a sharing of resources from the first set of resources between the virtual routers (a single control function) and based on independently assigning resources of the second set of resources to the virtual router (the respective packet flow rates of the ingress data queues associated with the each VRI are independently adjusted; each VRI 50 and 52 have its own routing domain).

Ayres does not disclose that resources are user programmable.

Shafer teaches a router management interface that provides access to software modules and other resources residing on the router. The router management interface permits various entities, **such as human users and automated scripts, to configure the router**. Using the router management interface, the entities can make changes to the present router configuration and more efficiently manage router resources, policies and relation ships with other routers (page 1, 0004).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the teachings from Shafer of user programmable resources to the routing system of Ayres. The benefit using programmable resource is that programs can be changed and upgraded and new futures are added easily than hardware changes.

Regarding claim 17, Ayres discloses the method wherein the first and second sets of resources are implemented by a single physical router system (see fig. 1, router 20).

Regarding claim 19, Ayres discloses the method wherein the resources of the first and second set of resources include logic resources (a communication interface 40 and a single control function (CPU)) and physical resources (each VRI have its own routing domain; flow manager 54 controls the packets flow rates).

Regarding claim 20, Ayres discloses the method wherein the logic resources include routing processes (a communication interface 40, comprising a plurality of a software configurable DSPs 42 that processes (demodulates) upstream packets) and forwarding process (CPU selectively retrieves packets from the ingress data queues and forwards the retrieved packets to output queues).

Regarding claim 21, Ayres discloses the method wherein the physical resources include control resources (each VRI have its own routing domain) and data resources (flow manager 54 controls the packets flow rates).

Regarding claim 23, Ayres discloses a routing system comprising: means for performing routing processes (communication interface 40); means for performing forwarding process (CPU 44); means for implementing control resources (CPU 44); means for implementing data resources (Flow Mgr 54); and means for running a plurality of virtual routers (VRI 50 and 52)

Art Unit: 2616

that share selected ones of the means for performing routing processes, the means for implementing control resources and the means for implementing data resources (router 20; column 4, lines 28-40).

Ayres does not expressly disclose that resources are user programmable.

Shafer teaches a router management interface that provides access to software modules and other resources residing on the router. The router management interface permits various entities, such as **human users and automated scripts, to configure the router**. Using the router management interface, the entities can make changes to the present router configuration and more efficiently manage router resources, policies and relation ships with other routers (page 1, 0004).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the teachings from Shafer of user programmable resources to the routing system of Ayres. The benefit using programmable resource is that programs can be changed and upgraded and new futures are added easily than hardware changes.

Regarding claim 27, Ayres discloses the routing system wherein the means for implementing data resources includes means for implementing a port bandwidth of the routing system (the respective packet flow rates of the ingress data queues associated with each VRI are independently adjusted).

3. Claims 8-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alfieri et al. (US 2002/0099849) in view of Shafer (US 2002/019874 A1).

Regarding claim 8, Alfieri discloses a network point-of-presence comprising: a physical router (14) system having a plurality of resources (routers; routing tables; communication links; memory; a mapping table; OSPF (*that is used to calculate routes by the number of routers, transmission speed, delays and route cost*); BGP (*BGP is a Gateway Protocol which routers employ in order to exchange appropriate levels of routing information*) etc.); at least one backbone router (VBR 22) implemented as a virtual router by the physical router system (14); and at least one regional router (VAR 20) implemented as a virtual router by the physical router system (14), wherein the backbone virtual router (22) and the regional virtual router (20) share resources of the physical router system (see figs. 2-5; 0033-0036).

Alfieri does not expressly disclose resources that modifiable by a user.

Shafer teaches a router management interface that provides access to software modules and other resources residing on the router. The router management interface permits various entities, such as **human users and automated scripts, to configure the router**. Using the router management interface, the entities can make changes to the present router configuration and more efficiently manage router resources, policies and relation ships with other routers (page 1, 0004).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the teachings from Shafer of a programmable resource to the routing system of Alfieri. The benefit using programmable resource is that programs can be changed and upgraded and new futures are added easily than hardware changes.

Regarding claim 9, Alfieri discloses the network POP further comprising: ports connecting the backbone virtual router to a high capacity transit network (fig. 2, backbone links 18); and ports connecting the regional router to a metropolitan area network (links 16).

Regarding claim 10, Alfieri discloses the network POP wherein the physical router is a single physical router (router 14).

Regarding claim 11, Alfieri discloses the network POP wherein the plurality of resources includes logic resources (0032, 0037) and physical resources (routing tables, communication links).

Regarding claim 12, Alfieri discloses the network POP wherein the logic resources include routing processes (0037) and forwarding processes (0032).

Regarding claim 13, Alfieri discloses the network POP wherein the physical resources include control resources (each VAR 20 has its own routing table; the VBR 22 maintains a full BGP routing table (0023-0024, 0036)) and data resources (see fig. 4 and 5).

Regarding claim 14, Alfieri discloses the network POP wherein the control resources include at least one routing table (each VAR 20 has its own routing table; the VBR 22 maintains a full BGP routing table (0023-0024, 0036) and the data resources include transmission bandwidth of at least one port of the routing system (as shown in fig. 4, a number of physical

Art Unit: 2616

interfaces 50 connect to the access links 16 and 18 (ports). Examples of such interfaces include Ethernet interfaces, SONET interfaces etc.).

4. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ylonen et al. (US 2002/0062344) in view of Shafer (US 2002/019874 A1).

Regarding claim 1, Ylonen discloses, in Fig. 1b, a plurality of virtual routers 110-112 (claimed a plurality of virtual routers) that use the **same hardware**, (i.e. the physical input lines and output lines) and **same processor** 116 (claimed a plurality of routing resources). The virtual routers are separate entities and suitable multiple access scheme is applied to **share the common physical resources** between them (0004).

Ylonen fails to disclose resources that are programmably modifiable.

Shafer teaches a router management interface that provides access to software modules and other resources residing on the router. Using the router management interface, the entities can make changes to the present router configuration and more efficiently manage router resources, policies and relationships with other routers (page 1, 0004).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the teachings from Shafer of resources that are programmably modifiable to the routing system of Ylonen. The benefit using programmable resource is that programs can be changed and upgraded and new features are added easily than hardware changes.

Art Unit: 2616

Regarding claim 2, Ylonen discloses the routing system wherein the routing resources include logic resources (processor) and physical resource (same physical input lines 114, output lines 115).

5. Claims 6, 22, 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ayres in view of Shafer as applied to claims 1 and 23 above, and further in view of Alfieri.

Ayres in view of Shafer discloses all the claim limitations as stated above. Ayres, further, discloses that the router 20 includes **a shared buffer memory 46** and each VRI 50 and 52 have its **own routing domain** (as in claim 26). However, Ayres does not expressly disclose the control resources include at least one routing table.

Alfieri teaches several virtual access routers 20 and virtual backbone router 22 that are associated with respective customers. Each VAR 20 has its own routing table and runs its own instances of the routing protocol. The VBR 22 generally maintains a full BGP routing table. Further, Alfieri teaches that wide-area network 10 may employ routing protocols such as BGP, OSPF, RIP, etc. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add routing table, such as suggested by Alfieri, to the VRI of Ayres in view of Shafer in order to provide an efficient and reliable communication system.

Response to Arguments

6. Applicant's arguments with respect to claims 16, 8-14, 16, 17, and 19-27 have been considered but are moot in view of the new ground(s) of rejection.

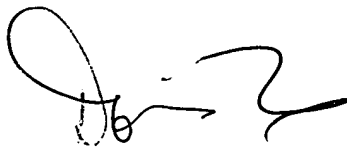
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saba Tsegaye whose telephone number is (571) 272-3091. The examiner can normally be reached on Monday-Friday (7:30-5:00), First Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on (571) 272-7629. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ST
July 3, 2006



DORIS H. TO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600